HOMO ARCTICUS

By

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I am approaching the subject not as an anthropologist, which I am not, but as a biologist. Wherever he is, man is a member of the natural system, being himself a product of nature; this is true, I suppose, even on the moon. I am not suggesting a new species by my title of "Homo arcticus", but I am suggesting that in the framework of the northern ecosystem man is represented by several phases, or morphs, each of which has played in the past, and plays to day,

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a different role, or fills a different and separate niche.

The high latitudes of both hemispheres display certain ecological characteristics peculiar to them and to certain special regions such as mountainstops and deserts. The number of species, both plant and animal, is far lower, often by a factor of 10 or much more, than in the tropics, and the ecosystems are consequently unstable, in the sense that the oscillations of numbers, over periods of years and also seasonally, can be very highly developed indeed. Another characteristic is the abundance of intra-specific variation, including genetically balanced polymorphic forms, a level of variability that appears to be significantly higher than is found in the lower latitudes. The significance of this, at the ultimate level, may be adaptation to the oscillating and apparently unpredictable nature of the environment, or it may represent a state of on-going speciation towards greater faunal diversity and greater system complexity (hence greater stability); very probably both significances are valid.

Both the low number of species and the variability, in fact, are directly related to the oscillating environment of the high latitudes and also, in my opinion at least, to the youth of the system as a whole. It is not long since the end of the most recent glaciation, and I have suggested elsewhere that ecological equilibrium has not yet been reached, which would in part explain both the low species number and the intraspecific variability. Certain environmental factors appear also to be related to this young age, such as shallow soil and the low capital of plant nutrients both on land and

in aquatic environments. Low temperature as such does not seem to be important as a limiting factor either to the variety or to the evolution of life, contrary to popular belief and the reputation it has earned as the dominating and most significant characteristic of the polar regions. Mammals and birds, terrestrial and aquatic, seem to have no difficulty in adapting to the low temperature, and in the poikilotherms there has been demonstrated an impressive ability to change the base of the Q-10 law so as to maintain high metabolic activity at environmental temperatures which would render temperate and tropical forms quite helpless.

What is true of other animals, both homotherm and poikilotherm, with respect to temperature, is most certainly also true of man. Man is an animal of tropical origin, and in accepting the "Toynbee Challenge" (out of Africa, through the Mediterranean, and to points east, west, north and south) he has had to become adapted to temperate and polar conditions by the fast route, namely the exercise of his brain and the development of technology. The Eskimos, which I understand we should now call by their own name of Inuit, often considered "primitive" people by the world to the south, have developed the most perfect technological ability by which to form part of the Arctic ecosystem at their own non-industrial level. Their clothing was ideal, and both the clothing and the housing were nicely adjusted to the demands and resources of the environment. The seasonal oscillation and the behaviour and growth rates of the animal populations upon which they depended for a living were adjusted to by the development

of a nomadic habit and a fairly loosely-organized and small community unit. We can see the value of such habits in what is happening today to the Arctic Char fishery, in which the concentrated and "rational" method of modern man is destroying an important resource in various local regions. (The Danes in Greenland, incidentally, have done much better than we have in this respect as in others; the char fishery is kept nomadic and with strict quotas for each stream). The social and sexual economy of the Eskimos were also well adapted to the natural situation. A basically communistic way of life ensured the survival of the maximum possible number in any given unit in conditions in which the food supply was not always reliable. The Eskimo was, in fact, his brother's keeper. If a man planned to make a journey on which the particular talents of his own wife were not so well adapted to the special demands to be met as were those of his neighbour's wife, say in the care of particular clothing, then a swapping arrangement was the logical and reasonable thing to undertake. And, finally, if the community were close to starvation, selective gerontocide and infanticide, even cannibalism, were resorted to.

Such practices were not considered the "in thing" by civilized man, although we condone far savager habits every day in our own way of life; and the control and alteration of this ancient Eskimo system, which stayed neatly in balance with nature, -- was in fact part of nature -- was imposed upon it from outside, by the invasion into the north of a number of what I will call "phases of humanity", analogous to invading new species, and also analogous to

the intra-specific variants and morphs which I have already mentioned. Such phases are, more or less in order of appearance: explorers, whalers, traders, missionaries, Government officials and agents, prospectors, scientists, miners, military, oilmen. Each phase has had its own impact on the north.

There are at least two sorts of men lumped under the term "explorer". There is first the explorer of the old type, sent on a basically economic mission by his country, to find new trade routes and new markets, new countries to settle. Such were the Vikings and their successors, as Erik the Red and his son Leif; also Baffin, Davis, Frobisher and the other Northwest Passage men. They were great travellers and navigators, and their work had abiding results long after they died. With very few exceptions, however, they had had little immediate or contemporary impact on the north themselves. It was not their intention to settle or to trade, but to make these things possible for others. One outstanding exception to this, of course, is Erik himself, and Leif Erikson, Karlsefni and the rest of that hardy and picturesque crew. Greenland was apparently unoccupied when they arrived there, and Iceland also. These must be the only instances within historic times of the thrill of arriving on totally new country, unopposed (or unwelcomed) by any other human group, a pleasure which must have been commonplace earlier in the history of man, as in the case of our own Eskimos and Indians. The Greenland Norsemen ultimately came into contact with Eskimos in West Greenland, by the migration of the latter rather than of the former, and they

interbred, to the advantage of the common stock.

Another kind of explorer is more recent, the man who enters the game for personal glory more than for anything else. In the context of human ecology, or of economy in general, these are not important, no matter how many flags are flown. There is even something a little sad about them. There are famous names among them, however, for whatever reason. There can also be entertainment and fun in their efforts. Recently I heard a light-hearted account of two expeditions in Hovercraft, organized with commercial purposes in view, one in South America and the other in the Lake Chad region of Africa. In the former, the machine earned the nickname of "El Fantastico", and in the latter, "La Tortue Terrible". The same group are now planning a trans-Arctic expedition, and were it not for the fact that Hovercraft are already known to the Eskimos in several regions, and that the Eskimos have become pretty blasés about white man's machinery, one might predict that in the Arctic the Hovercraft might become known as "Tupilarjuak", or something like that.

If the early explorers represent economic man, class I, class II consists of the whalers and the traders, both of whom seem to have earned the general disapproval of the next group, the missionaries. If one goes only by the values of the missionaries, this disapproval is no doubt justified; but by the values of the ecologist, the whalers and traders were perhaps less harmful than the missionaries. The whalers met the native population when they came ashore, and no doubt

there was much social coming and going on such occasions, a little trading, a little gene flow, and some transmission of disease. Only the last can seriously be considered as regrettable, and even that, in its inevitability, is not something for which the whalers themselves can be blamed; it was the result of the simple contact between two groups of human beings that had hitherto been separated. On the social level, the Eskimos and the whalers had considerable regard for the skills and traditions of the other, and this is always a very important point. Each learned from the other.

On the other hand whalers, or more properly the whaling owners and financiers, did do damage to the whale populations themselves, and in doing so depleted a resource which was important to the indigenous people. It is not possible to estimate the extent of this damage, and in any event only certain local groups of Eskimos relied to any important extent on the large whales, which (especially the Greenland or Bowhead whale) were the species attacked by the whalers. The Bowhead whaling stopped in the second decade of this century, and since then the whale population has shown definite signs of rehabilitation. It is quite likely that these particular whales will be used by the Eskimos again.

In Arctic Canada, the term "trader" now means the Hudson's Bay Company. Others have been, such as the Northwesters and Revillion Frères, but it is the H. B. C. that for three hundred years has been at the top of the ecological pyramid of numbers in our northland ecological system: plants, lemmings, owls, foxes, Eskimos, and

HBC. This development of trading settlers, or trading settlements, was the first definitive and lasting novelty in the old system. It gave a value to the fox and, farther south, the beaver, which the Eskimos could not have dreamed possible, and it introduced to the Eskimos, as the years went by, tea, coffee, the rifle, flour, textiles and tobacco; steel knives and sugar; good boats and engines; wooden houses, aircraft, and radio; and much of the rest of our technological stock in trade.

Was this bad? I think not. In my experience of trading posts in the Eastern Arctic, the human atmosphere is good, the rapport between trader, or post manager and staff, and the native people has been healthy and tuned by mutual respect. And the trade has not destroyed the relation of the Eskimo to the country in which he lives. It has, no doubt, introduced tooth decay and some tuberculosis, but both of these can be prevented by proper action. It has also introduced foreign blood into the native population; the terms "Improved Boots" and "smoked boots" witness to this healthy mixture, and they are more complimentary to the Eskimos and Indians than they are to the immigrants from Aberdeen and Peterhead. The rifle undoubtedly raised the danger of overkill among the caribou, but this, too, like tuberculosis, venereal disease and dental caries, can be regulated and corrected. This part of the pattern is the business of the government agents, the police and game wardens and the medical services, and it is not my intention here to be critical of any one of these branches.

In fact, if I had the time to expand on this subject, I would do the reverse, pointing out that these three agencies have done very well in our Arctic. The RCMP, for instance, has been most successful in recruiting the right kind of man for the job, as the record clearly shows. We sometimes, perhaps all the time, lose sight of the fact that the development of the economy in the north is essentially a colonial problem, analogous to what the major colonial powers have had to deal with in Africa and Indonesia, and I think there is no doubt the central authority in Canada has put up a performance which compares very favourably with other areas in the world. The final phase of such developments, that of self-government and local authority, is now in process of deployment.

The impact of the Missionaries is special, and touchy. The urge to Christianize is not so well developed today as it used to be, and many of us breathe a little easier for the decline in zeal. I believe it is true to say that the three Denominations that have been engaged in the Canadian North, from the Labrador to the Mackenzie Delta, have carried on their missions with humour and understanding, not with any mediaeval intolerance of the benighted heathen, and their ecological effect has on the whole been nil, which speaks highly of their good sense. On the positive side, they have developed dictionaries and begun the task of developing a written Eskimo and Indian, although in this they have been left at the post by the Lutheran Missionaries and teachers in Greenland, whose performance has been

outstanding, however, have found it hard to accept the fact that there is no necessary connection between education and the church, any church. The problems of education as such have now been taken over by Government, and I shall come back to this in a moment.

Scientific research in Arctic Canada developed rather slowly at first, and also rather late; and since the question posed by Dr. Finnie sixty years ago will be answered in terms of scientific knowledge rather than in any other language, it is of first importance. After all, part of what we are celebrating today is the opening of an Arctic laboratory, specifically designed to play its part in the scientific development of the north; the University of Alberta is to be congratulated for this initiative, and so is the National Research Council for having the good sense to support the project financially.

I remember, as a young and idealistic student, standing in an office in the then Department of Mines and Resources in Ottawa and hearing a senior servant of that Department say "We don't want any (blank blank) scientists in our Arctic". Try to imagine my astonishment and mortification. That was in 1937, and you will see that times have changed since then. In fact it was just about then that the times did change, most markedly. There are those who maintain that we have been caught scientifically unprepared for the sudden upsurge of industrial activity triggered by the discovery of oil in the north. It is true that there are certain scientific questions, most of them practical questions, which have to be answered urgently, but we would have been totally unable to undertake their solution

were it not for the large corpus of scientific knowledge about the north that has accumulated since the beginning of the second world war. Suppose, for instance, that we were suddenly asked today to estimate the effects of the oil industry and large-scale mining in the Arctic upon the natural world, the ecosystem at large, without the past thirty years of ecological work. It would be impossible without the basic work, the ecological inventory and the knowledge we now have of the nature and behaviour of the northern ecosystems. The same is true of the study of permafrost, ocean currents and climate in the north; or any field you care to name. As it is, the practical problems to be faced can without doubt be solved, or at least squarely faced, within the time we have; assuming that the oil companies are right in telling us that the estimated time of arrival of the first oil out of Arctic wells and drillings is 1976.

The scientist in the field does not disturb the natural order; he goes about his work quietly (except for those who detonate charges under water to see how sound travels in the Arctic Ocean), and in the eyes of the Eskimo he is the all-time innocent, the one who has to be taken gently by the hand so that he does not come to grief in pursuing his eccentric interests. But his work, strange though it may appear to be, has enormous potential for the future, and some of the Eskimos now recognize this, as they have done in Greenland for many years.

The practical questions that now confront us, in the

face of the oil development, are simple enough to state and probably most of them are fairly simple to answer. They are of this sort: How are pipelines going to affect tundra terrain? How will they affect the behaviour of large mammals? If gravel is needed in large amounts for the laying of pipelines, where does the gravel come from? (This is a nasty one, because the answer is most likely "from riverbeds", which would not do at all). How does crude oil behave in Arctic sea water, covered or not covered with ice? What is the effect of oil spills on Arctic sea life? And, the general ecological question: How much "stress" can the Arctic ecosystems stand without collapsing?

The last of these questions is the most interesting and the most difficult to answer. I pointed out at the beginning of this paper that Arctic ecosystems are simple, of low diversity and high oscillation. They are consistently called "delicate" in the public press. I wonder how delicate they really are. The chief "oscillator" in the tundra ecosystem, to take an example, is the lemming; as the primary herbivore, it has large reproductive potential and is the focus of attention by the carnivores. Its population oscillates with large amplitude in a period of from 3 to 5 years, and in years of low population it is often to all intents and purposes extinct locally; that is, in a given area it may be totally absent. Yet the system survives, and the lemmings reappear, no doubt by invasion from adjacent regions following the trough in the population curve.

This suggests that in fact the system is much tougher than is popularly supposed, and it is as yet an open question whether oil development could do more than the system does itself in its natural oscillation. We are not talking here about possible species extinction, certainly not in the case of the lemming. If rare species, or species with few and local breeding areas, are threatened by industrial development, then the same rules apply in that case as would apply anywhere in the civilized world; special protection would have to be given. The same is true, by analogy, of other hazards to species or to local populations -- the ordinary rules of fish and game protection apply in the Arctic as elsewhere, and they have to be enforced there as elsewhere, and the same goes for the pesticide menace.

Heavy industry in the north, which is now just round the corner, will raise much greater problems with respect to the native population than in the matter of the natural ecosystem as such. This is where the confrontation between two very different phases, or morphs, of Homo arcticus will be most serious, the Eskimo and the industrialist. The confrontation has in fact begun.

This is an old problem. It has appeared everywhere where industrial man has gone abroad into countries of an earlier stage of economic development, and it has usually been mismanaged, to the detriment of both industry and native population. It looks like being mismanaged in Arctic North America, unless we are careful and forewarned. To try to graft a native, ecologically based culture

on to a developed industrial culture is to try to mix oil with water, to use a not inapt simile. The natives are usually called "lazy" by the other side, and as a rule the native population is too polite to say what they really think of the industrialists. To the simple-minded man of industry (and some of them really appear to me to be children), there is no doubt that if you pay a man a standard wage, you must expect him to be on the job from 9 to 5, or 8 to 4, and if it is suggested that this is not reasonable in the case of the Eskimos or Indians, they simply do not know what you are talking about and are not willing to learn. There are exceptions and the exceptions are very important, but this is the result of my somewhat limited research.

Problems of this sort involve education, and education takes time. I said a moment ago that in terms of scientific research we were not so badly off to meet the present crisis in the north; in terms of education we are in state of near nudity. This is not the place to discuss education in the Arctic at length; all that can be done is to make two points: First, that the present educational policies in the north seem totally unadapted to the problems at hand (Dick and Jane live in Montreal and Toronto, not in Inuvik; and what is the use of asking an Eskimo child why the chicken crosses the road, when most of them have seen neither a chicken nor a road?); and second, that not enough attention has been paid to the Greenland example in this matter. Schools in Greenland began in the first half of the 18th Century, and for 200 years followed a policy of

instruction in Greenlandic (Eskimo). All teachers from Denmark had to be fluent in Eskimo, and indeed so did all government servants, and they still do. Only during and after the second world war did the Greenlanders themselves begin to suggest that it was time for instruction to go forward in Danish, and only by that time were the Greenlanders themselves really able to cope with the industrial world. Now it poses no terrors for them; they can accept on its own terms.

You may say, yes, but that takes time. That is precisely the point. We have been very slow to take up this problem, and we are now faced with a confrontation of two very different phases of humanity. The solution of the problem will require great patience and great understanding on both sides; at present most of the understanding seems to be on the Eskimo side. They are a very adaptable people, the Eskimos, and they learn fast, but we are facing them with an urgency that may be too much even for them. Of the Indians I cannot speak.

One last point: Man has now become a geomorphic force; he will very shortly be able to change his environment on a large scale, as he has been able for many centuries to change it on a small scale. The control of climate is not now very far off, and nowhere will climatic control hold greater potential for change than in the north. For this it will be essential that all the cultural morphs of Homo arcticus be in agreement from the start and work together. When that happens we may perhaps pride ourselves on having produced a new cultural species.